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PHARMACOECONOMIC IMPACT OF UPFRONT USE PLERIXAFOR FOR AUTOLOGOUS STEM CELL MOBILIZATION IN MULTIPLE MYELOMA PATIENTS

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Stem cell mobilization with granulocyte-colony-stimulating factor (G-CSF) is associated with about 25% of unsuccessful mobilization. Plerixafor was granted FDA approval based on improved rate of successful mobilization as an upfront mobilizing agent. However, because of its cost, it is often reserved for patients who failed previous standard mobilization.

This retrospective study, performed between January 2008 and April 2011, included 50 adult patients with multiple myeloma (MM) who underwent ASCT. Twenty-five patients received plerixafor, in combination with G-CSF, and 25 patients received G-CSF alone as an upfront mobilization therapy. In April 2010, a practice change was instituted to delay initiation of G-CSF from day 0 to day +5 following ASCT. Simultaneously, plerixafor was used, in combination with G-CSF, as an upfront mobilization therapy for autologous stem cell mobilization in MM patients. The primary objective of this study was to assess pharmacoeconomic impact of using plerixafor as an upfront mobilization therapy in patients with MM. Compared with the control, plerixafor mobilizations yielded higher CD34+ cell content [mean ($x10^6$ CD34+ cells/kg), 16.1 vs. 8.4; $p = 0.0007$], higher number of CD34+cells infused [mean ($x10^6$ CD34+ cells/kg), 7.6 vs. 4.4; $p = 0.0017$], required fewer number of G-CSF doses for both stem cell collection (mean, 5.9 vs. 7.1; $p = 0.0001$) and for neutrophil recovery (mean, 8 vs. 11.8; $p<0.0001$), and required fewer number of apheresis (mean, 1.9 vs. 3.1; $p = 0.0001$). The plerixafor group had a longer time to neutrophil engraftment by one day; however, this did not translated to longer days of hospitalization post-ASCT in the plerixafor group (mean, 15.2 days vs. 14.1 days; p = NS). In the plerixafor group, the mean number of plerixafor doses per patient was 1.8, and $9,082 per patient. The overall cost of medications was lower in the plerixafor group (mean, $18,538 vs. $22,442; $p = 0.014$); however the plerixafor group had similar cost for blood products per patient (mean, $2,029 vs. $2,332; p = NS), overall cost of hospitalization (mean, $57,424 vs. $61,474; p = NS), and combined cost of hospitalization and apheresis per patient (mean, $58,315 vs. $62,949; p = NS).

This data suggests that using plerixafor for upfront autologous stem cell mobilization in patients with MM significantly improves success rate of mobilization, decreases the number of apheresis sessions, and does not have a substantial pharmacoeconomic impact.

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IMMUNOGENICITY OF POLYSACCHARIDE PNEUMOCOCCAL VACCINATION IN AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Background: Patients undergoing autologous hematopoietic cell transplant (AHCT) are susceptible to pneumococcal infections. The CDC recommends pneumococcal vaccination of immunocompromised patients including AHCT recipients. We prospectively collected pneumococcal IgG titers in AHCT patients from prior to transplant until after their one year post-transplant polysaccharide pneumococcal vaccination (PSV23), with the goal of determining the immunological response of vaccination.

Methods: From June 2009 through March 2010, 50 participants with Hodgkin's lymphoma, non-Hodgkin's lymphoma, or multiple myeloma scheduled for AHCT consented to have their serum collected prior to transplant (Titer 1), 3-7 days following ASCT (Titer 2), 1 year later at the time of vaccination (Titer 3), and at 4-6 wks after vaccination (Titer 4). Adequate immunological response was defined as a $\geq$ 4-fold increase in titer or a titer of $>$ 1.3 mg/dL following vaccination. Of the 50 patients enrolled, 10 expired, 2 had disease progression, 1 developed co-morbidity preventing transplant, and 27 resumed care with their local oncologists within 1 year following ASCT (before Titer 3). Data were collected through the second titer for 35 participants, and all 4 titers for 10 participants.

Results: No significant change in titer was demonstrated immediately following AHCT (Titer 1 to 2) or at 1 year follow-up (Titer 2 to 3). Furthermore, adequate antibody response after vaccination (Titer 3 to 4) occurred for only 3 of the 23 of the serotypes: 4, 12F, and 15B ($p = 0.05$). When compared to 50 healthy historic controls who did not undergo ASCT, there was a significantly lower response of the 5 serotypes compared (4, 8, 12F, 14, 19F) in our ASCT patients ($p < 0.0001$).

Conclusion: We conclude that there is minimal measurable immunological response to the PSV23 vaccination following AHCT. Current guidelines recommend the 7-serotype (4, 6B, 9V, 14, 18C, 19F, and 23F) pneumococcal conjugate vaccine starting at 3-6 months following transplantation, followed by 2 boosters 1-2 months apart, with the option of PSV23 vaccination at 1-year post-transplant. Our study highlights the urgency of further investigation into optimal vaccination strategies in AHCT recipients.

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PATIENT AND FAMILY OUT-OF-POCKET COSTS OF ALLOGENEIC HEMATOPOIETIC CELL TRANSPLANTATION (HCT): A PILOT STUDY

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Allo HCT can result in significant financial impact on patients and their caregivers. Patient out-of-pocket costs associated with HCT are not well known. We conducted a pilot study to determine the feasibility of measuring out-of-pocket costs during HCT. Adult recipients or parents/guardians of pediatric recipients of allo HCT were eligible to participate if they were within 2 years of diagnosis of their underlying disease and had sufficient English proficiency. Recipients were required to have a caregiver who was a member of their household. Prior to HCT, participants completed a baseline survey regarding household income, resources and insurance coverage. Subsequently, they maintained a diary to track daily out-of-pocket costs for the first 3 months after HCT. In the event of patient death, the caregiver could continue participating in the study. The paper-based diary was developed by study investigators and was designed to capture expenses related to meals, lodging, uncovered medical costs, transportation and other expenses. Participants mailed diaries to the CIBMTR every 2 weeks and were given a gift card for each submitted diary. Telephone interviews were conducted to followup on missing/incomplete diaries. Within 4 weeks of completing the diary phase, a telephone interview was conducted to evaluate the diary. Patient, disease and HCT information was obtained from the CIBMTR database. Three sites enrolled 10 patients each; 25 completed the baseline survey, 15 completed all diaries over 3 months and 18 evaluated the diary at the end of 3 months. On average it took 22 minutes/day to complete the diary. Reasons for dropout were patient death (N = 4), burden of completing diary (N = 2) and other (N = 4). Participant baseline demographics and out-of-pocket costs are described in the table. Pre HCT, 20/25 (80%) expected HCT would have a great/moderate impact on household income, and only 8 (32%) were very confident/confident that they would be able to meet their financial obligations. 15/18 (83%) participants who completed study evaluation found the diary easy to use and 12 (67%) felt phone reminders were helpful. 13 (72%) felt very/somewhat comfortable answering income questions and 16 (89%) felt very/somewhat comfortable answering questions about expenses. Our study shows feasibility of using a paper-based instrument to capture out-of-pocket costs related to HCT. Qualitative data obtained with evaluations will be used to further refine the instrument.